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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,200	02/06/2007	**Klaus Dieter Karl Neumann**	TS1436 US	1416

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EXAMINER	
SAHA, BIJAY S	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,200	NEUMANN ET AL.	
	Examiner	Art Unit	
	BIJAY SAHA	4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/6/2007, 4/27/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

The claims 1-28 are pending and presented for the examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as obvious over Pierce et al US 3,378,992 (hereafter US '992).

Regarding **claim 1**, US '992 teaches process for removing sorbable components (Abstract) from a gas stream (Abstract) the process comprising contacting part of the gas stream as a first gas stream at an elevated temperature with a first adsorbent bed (Fig 2 Absorption Tower A) in thermal regeneration mode (col 9 line 55) to remove contaminants present on the first adsorbent bed, to obtain a second gas stream that is enriched in contaminants compared to the first gas stream (Fig 2 Absorption column B);

cooling the second gas stream to a temperature such that at least some contaminants begin to condense into a first liquid phase (Fig 4 atmospheric cooler) that is rich in contaminants and separating the first liquid phase from the second gas stream (Fig 4 gas scrubber) to create a third gas stream (fig 4), the gas/liquid separation step forms a first gas/liquid, the third gas stream to a second gas/liquid separation step (Fig 4) to obtain a second liquid phase that is rich in contaminants and a lean gas stream having a cricondentherm lower than that of the natural gas stream.

Examiner views cooling to produce condensation is a function of the feed stock composition. Prior art US '992 teaches atmosphere gas cooling and scrubbing. Examiner maintains that the cricondentherm is the maximum temperature where the two phases co-exist. The prior art US '992 does not specifically state that the gas stream cricondentherm is lower than the feed stream. Since the prior art (US '992) teaches the gas stream purification by absorption beds, it would be expected that the cricondentherm would be lower than the feed stock of natural gas stream.

The prior art teaches the cyclic four bed process for purification of the gas utilizing a three way feed split (Fig 6) and four way gas stream (Figs 4 and 5) using the coolers to cool the gas stream. At the time of invention it would have been obvious to a person of ordinary skill to perform the gas purification utilizing a 3-way feed gas split and combining the product from each step for the next operation to enhance the contaminant removal process.

Regarding **claim 2**, US '992 teaches a second split of the feed gas in contact with the absorbent (Fig 4, 5).

Regarding **claims 3 and 4**, US '992 teaches mixing of the purified and unpurified gas streams (Fig 6 and 7).

Regarding **claims 5, 6 and 7**, US '992 teaches the purification of the feed stock by contact of the feed stock gas with the absorbent beds. In examiner's view, it is inherent that at the completion of the process, or at the partial completion of the process as of the 2nd or 3rd stream, the impurity level would be lower than the input feed stock. Examiner maintains that the cricondentherm is the maximum temperature where the two phases coexist. Therefore it is obvious that the lean gas stream would have a lower value of the cricondentherm. The exact value of the cricondentherm depends upon the gas composition. Reduction of cricondentherm would be a function of the baseline cricondentherm of the feed stock.

Regarding **claim 8**, US '992 teaches a cooling step (Fig 3) consisting of atmospheric cooling which is expected to be above water freezing temperature.

Regarding **claim 9**, US '992 teaches absorbent gas temperature 90°F to 110°F (Col 10 line 28).

Regarding **claim 10**, US '992 teaches the absorbent column temperature elevated to 500°F to 600°F (Col 9 lines 56).

Examiner's note on the overlapping ranges in the **claims 9 and 10**: MPEP 2144.05 [R-5] Obviousness of Ranges, "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists".

Regarding **claim 11,** US '992 teaches the cooling (col 12 lines 29) and the main production separator/scrubber (Fig 5).

Regarding **claim 12,** US '992 teaches the gas stream cooling via atmospheric cooling (Fig 5).

Regarding **claim 20**, US '992 teaches an adsorption bed arranged to receive part of the natural gas stream as a first gas stream (Fig 4) and provided with a means for heating the first adsorbent bed (Col 9 lines 56) , which first adsorption bed has an outlet for a second gas stream (Fig 6); a cooler for cooling the second gas stream (fig 6), a first gas/liquid separator for separating the cooled second gas stream into a first liquid phase and a third gas stream (Fig 4) a second gas/liquid separator for separating the third gas stream into a second liquid phase and a lean gas stream (Fig 4).

Claims 13, 14, 15, 24, 25 are rejected under 35 U.S.C. 103(a) as obvious over US '992 in view of van Veen et al US 6,280,502 (hereafter US '502).

Regarding **claims 13, 14 and 15**, teachings of US '992 have been delineated above in the claim rejections of claim 1 through 12.

US '992 does not explicitly teach the art of separation by accelerating the feed stock to a high or supersonic velocity (Figs 1, 2 and 4, Claims 1-5).

US '502 teaches a method of supersonic velocity through a conduit causing the particles to flow in a swirling motion to an outer section.

At the time of invention it would have been obvious to a person of ordinary skill to perform the gas treating process (US '992 teaching) utilizing the art of supersonic velocity separation (US '502 teaching). The suggestion or motivation for doing so would have been to perform the phase separation efficiently with a broad process latitude.

Regarding **claims 24 and 25**, US '502 teaches a method of supersonic velocity through a conduit causing the particles to flow in a swirling motion to an outer section. At the time of invention it would have been obvious to a person of ordinary skill to control and adjust the fluid velocity from supersonic to sub sonic to enhance the separation.

Claim 16, 18, 19, 21, 22, 23, 26, 27 and 28 are rejected under 35 U.S.C. 103(a) as obvious over US'992 in view of Peter et al DE 19840409 (hereafter DE '409).

Regarding **claim 16,** teachings of US '992 have been delineated above in the claim rejections above.

US '992 does not explicitly teach the utilization of refrigeration.

DE '409 teaches the refrigeration (pages 2-3).

At the time of invention it would have been obvious to a person of ordinary skill to perform the gas treating process (US '992 teaching) utilizing the art of refrigeration (DE '409 teaching). The suggestion or motivation for doing so would have been to enhance the phase separation by cooling the gases to a lower temperature.

Regarding **claim 18,** US '992 teaches heating the gas in the first stream (Col 9 line 27).

DE '409 teaches the refrigeration (pages 2-3).

Regarding **claim 19,** DE '409 teaches the refrigeration (pages 2-3). Examiner views that a heated gas can be cooled to a predetermined value before being in contact with the absorbent bed.

Regarding **claim 21**, US '992 teaches a second absorbent bed (Fig 4 and 6 and system of 3-way valves) to receive the gases.

Regarding **claim 22,** US '992 teaches second absorbent tower (fig 4) receive other part of gases.

Regarding **claim 23,** DE '409 teaches the refrigeration (pages 2-3). At the time of invention it would have been obvious to a person of ordinary skill to utilize the refrigerator in place of a cooler (US '992 teaching). The suggestion or motivation for doing so would have been to further reduce the temperature to enhance the phase separation by cooling the gases to a lower temperature.

Regarding **claims 26,** DE '409 teaches the refrigeration (pages 2-3). At the time of invention it would have been obvious to a person of ordinary skill to utilize a refrigerator for separating the gases that are liquefied at low temperatures.

Regarding **claims 27,** US '992 teaches heating for the first gas stream (Col 9 lines 27).

Regarding **claims 28,** US '992 teaches a third absorbent column (fig 1) arranged to receive the gases from the prior columns (Fig 1).

Claim 17 is rejected under 35 U.S.C. 103(a)) as obvious over US '992 in view of Schultz et al Hydrocarbon Engineering June 2001 (hereafter Schultz).

Regarding **claim 17**, teachings of US '992 have been delineated above in the claim rejections above.

US '992 does not explicitly teach the utilization of hydrate inhibitor.

Schultz teaches the application of hydrate inhibitor injection (page 59).

At the time of invention it would have been obvious to a person of ordinary skill to perform the gas treating process (US '992 teaching) utilizing the art of hydrate injection (DE '409 teaching). The suggestion or motivation for doing so would have been to enhance the phase separation by not allowing water to attach with organic gases. Attachment to organic gases would not allow water to separate out.

Summary

The **claims 1-28** are rejected.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BIJAY SAHA whose telephone number is (571) 270-5781. The examiner can normally be reached on Monday- Friday 8:00 a.m. EST - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on (571) 272 1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BIJAY SAHA/
Examiner, Art Unit 4181

BS
March 1, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793